

Indo-China it is a surrogate for confectionery, and in parts of India, America, and elsewhere its use is due to the perverted taste often found in dyspepsia and hysteria, or to the strange abnormalities associated with pregnancy.

In the paper here noticed<sup>1</sup> the composition of the earth, marl, clay, or shale has been carefully analysed; the main constituents are silica (the percentage varying from 84 per cent. to 22 per cent.), lime (61 per cent. to a mere trace), alumina (26 per cent. to 2.5 per cent.), and ferric oxide (20 per cent. to a mere trace). But as a rule there is little definite information, other authors being content to speak of clay or earth without closer definition. We know, however, that steatite is favoured by the Indians of Hudson's Bay, and ferruginous clay by the Ottomacs, by the negroes of the Antilles, and by the Batanga of West Africa; earth rich in diatoms is used in North Europe, and the New Caledonians resort in time of famine to a mineral rich in lime, and ants' nests, with or without the larvæ, are eaten in Africa. The physiological basis of the habit varies probably in some degree with the different composition of the earths. On the Gold Coast white clay is used as a sweet-meal; in India the taste or odour is often the attractive feature; it may be noted in this connection that steatite (one of the minerals mentioned above) is not only eaten by wolves, reindeer, and other animals, but actually used as bait for attracting them. To the pleasant taste may be due the Roman use of chalk mentioned above; we have a parallel in the Bolivian Indian's use of a sauce of clay with his potatoes. In this category, too, we may range the German workman's "Steinbutter," and perhaps the salty earth used in Persia. In Senegal ochreous earth is mixed with rice, but it does not appear whether this is due to its pleasant taste or to a desire to increase the mass available for ingestion so as to produce a feeling of repletion.

In Rajputana the latter cause is undoubtedly the main factor; for only in times of famine are ashes, powdered steatite, clay or mud mingled with bark-meal. On the other hand, it is not so much actual famine in Persia as the desire to keep the digestive organs at work without suffering inconvenience from an over-supply of nourishment which is said to lead to the use of the two kinds of earth frequently sold in bazaars; one is described as a fine, white, "fatty" clay, the other as forming hard and irregular lumps. The material of ants' nests, like the Bergmehl (Kieselgur) of North Europe, is rich in organic matter, and may have real nutritive value; but on this point little positive information is available.

Especially in India the habit of earth-eating is indicative of a morbid condition, either anterior to the acquisition of the taste or after it has been adopted from imitation or some other cause. The same conditions seem to prevail widely in South America, where not only Indians and negroes, but whites, are slaves to the practice; it is even said that masks are put on children at night to restrain them from pulling mud or plaster from the walls and eating it.

The medicinal use of earths is a wide subject on which a large literature exists; our authors quote, among others, El-Baitar, who gives a list of the earths used in Spain in the thirteenth century; but the use of mineral substances in medicine hardly belongs to the same category as the other facts with which they deal; the same may be said of the ingestion of earths for magical purposes.

The effects on the eater seem to differ widely. In West Africa no bad effects follow, according to some

authors; but when the negroes reached the West Indies they found that ill-health resulted from their indulgence in decomposed porphyroid lavas as substitutes for their African earths. In India and South America anæmia and early death seem to follow as a matter of course, but the anæmic diathesis often exists before the habit is acquired, and may be the actual cause of it.

The quantity of earth or clay consumed is often considerable. Half a pound daily is the allowance for the Ottomacs; six ounces is recorded from Bengal. They are sometimes eaten raw, sometimes roasted; one of the most curious features is that the earth or clay is sometimes made up into cups, figurines, and other forms; thus the Lemnos earth used in Spain in the sixteenth century was cup-shaped, so is the clay used to-day in Bengal; in Bolivia figures of saints are among the forms, and the Javanese eat figures of men and animals. In these cases a magical element may perhaps be present. But the commoner form is that of powder; the only edible earth of which the present writer can speak from personal experience was in this shape; it was alkaline and more like tooth-powder than anything else.

N. W. T.

## NOTES.

DR. L. A. BAUER's resignation from the United States Coast and Geodetic Survey took effect on September 1. As already announced in NATURE, he has accepted the permanent directorship of the department of terrestrial magnetism of the Carnegie Institution of Washington. All his correspondence should be addressed to "The Ontario," Washington, D.C.

At the annual meeting of the Hull Scientific and Field Naturalists' Club just held, Mr. T. Sheppard, who for thirteen years has been the honorary secretary, was elected president of the society.

PROF. A. H. CHURCH, F.R.S., will give six lectures on chemistry at the Royal Academy of Arts on Mondays and Thursdays, beginning on October 1 at 4 p.m. The subjects of the lectures are:—Paper, canvas, panel, and other grounds; composition and classification of pigments; tests and trials of pigments; selected and restricted palettes; vehicles and varnishes; and methods of painting.

A NOTE from the Rev. Guy Halliday recording the discovery of *Goodyera repens* near Holt, in Norfolk, was referred to in NATURE of September 6 (p. 472). Mr. W. A. Nicholson, honorary secretary of the Norfolk and Norwich Naturalists' Society, informs us that the plant was found at Holt so far back as 1891, and at Westwick in 1885. It has since been noted in two other places in Norfolk.

A REUTER message from Palermo states that earthquake shocks were felt on September 19 at 11.20 a.m. and 1.38 p.m., principally at Trabia and Termini. A message from Lima reports that shocks were felt on September 18 at Huarmey, Alija, and Casma.

AN International Congress for Cancer Research was opened at Heidelberg on Tuesday by the Grand Duke and Grand Duchess of Baden in the presence of numerous representatives of medical, scientific, and municipal institutions of the world. At the same time, a new hospital and scientific laboratories for investigations into the cause and cure of cancer was opened. We learn from the *Times* correspondent at Heidelberg that the new buildings occupy nearly an acre, and are fitted with all the latest improvements, both for the treatment of operable cases and for

<sup>1</sup> "Earth-eating and the Earth-eating Habit in India." By D. Hooper and H. H. Mann. (*Memoirs of the Asiatic Society of Bengal*, vol. 1, No. 12, pp. 249-270.)

investigation. The institution has already cost more than 40,000*l.*, which was derived partly from public and partly from private sources.

PROF. HERMANN COHN, the well-known ophthalmologist of Breslau, died recently at the age of sixty-eight. His contributions to ophthalmic science and practice had reference more particularly to the eyesight of school children. He was one of the first to press the needs of many reforms with the object of conserving the pupils' vision, and he was a strenuous advocate of the systematic examination of the eyes of school children, his knowledge and experience in this connection being of the greatest value in evolving and perfecting the practical details of an important branch of work. In 1883 he was honoured by receiving the State gold medal of hygiene. He lived to see much good fruit result from his labours, and it may justly be said that with him there passed away one who served well both his own and future generations.

A PLEA for the preservation of natural scenes and objects in Germany was put forward a couple of years ago by Prof. H. Conwentz, director of the West Prussian Provincial Museum at Danzig, in a work on "*Naturdenkmäler*," described in these columns in November, 1904 (vol. lxxi., p. 73). By *Naturdenkmäler* is meant the whole natural landscape, with its various soil formations, its water courses and lakes, its special plant and animal communities, as well as single rare species and individuals of the original flora and fauna. Prof. Conwentz proposed that these results of nature's handiwork in the different States of the German Empire should be placed on record so as to make them known, and that provision should be made for their protection. The Prussian Minister of Instruction has just consented to the establishment of a central office for this purpose. For the present the office will be at Danzig, and will be under the direction of Prof. Conwentz.

In his presidential address at the annual congress of the Sanitary Inspectors' Association at Blackpool on September 13, Sir James Crichton-Browne dealt particularly with the rapid and remarkable fall in the birth-rate of Blackpool. It was in 1895 that a turn in the tide in the birth-rate of England and Wales was first recorded, since when it has gradually decreased, until in 1904 it dropped to 27.9, the lowest on record. In Blackpool the decline did not begin until 1898, when the rate was 27.74, showing a slight increase on the previous year; but since then it has been precipitous, reaching 20.30 per thousand for 1905. Many facts suggest that this decline in the birth-rate has occurred especially among the more intellectual, more cultured, and more prosperous classes of the community. Bearing in mind that 25 per cent. of the married population produce 50 per cent. of the next generation, and that mental and moral traits are not less hereditary than corporeal appearances, it is impossible to exaggerate the importance of the problems that are raised by the figures adduced. If we are recruiting our population from the poorer and mentally and physically feebler stocks of the community at a greater rate than from the better and more capable stocks, then gradual deterioration of the race is inevitable.

THE "coming of age" of the Royal Geographical Society of Australasia was celebrated at Brisbane at the end of June last by a festival extending over four days. On June 26 a reception and luncheon were given by the Mayor (Mr. J. Crase), and at an evening meeting addresses

of congratulation from other societies were presented, and the secretary, Dr. J. P. Thomson, gave an account of the history of the society. At an evening meeting on June 27 a paper by Dr. H. R. Mill, on the present problems of geography, was read. A garden-party was given at Government House in the afternoon of June 28, and at the evening meeting a paper by Prof. R. E. Dodge, Columbia University, on school geography, was read, Lord Chelmsford taking part in the discussion. A *conversazione* was given on June 30, at which it was announced that a paper by Sir John Murray, on the oceanography of the south-western Pacific, had been received too late for reading at the business meetings, but would be included in the society's Transactions. The Royal Geographical Society of Australasia was founded in 1885, chiefly on the initiative of its present secretary, Dr. J. P. Thomson. Its activities include the whole range of geographical work, and it has published twenty-one volumes of Proceedings and Transactions containing communications, of which "about 80 per cent. are original contributions to geographical literature, the remainder being the result of research work, in contradistinction to mere compilations."

THIS is the season for great hurricanes within the northern tropical belt. Thus far the West Indies have escaped, but the China Sea region was last week the scene of two very violent and destructive typhoons. On the morning of September 18 there does not seem to have been anything in the aspect of the weather at Hong Kong to suggest the proximity of a storm. People went about their business as usual, suspecting no danger, and the authorities at the observatory found nothing in the reports to justify the hoisting of the warning signals, expecting only moderate winds to prevail during the day. At about 10 a.m. the neighbourhood was startled by the sudden bursting of a storm of great violence, which maintained its strength until midday. In these couple of hours it occasioned enormous damage ashore and afloat. Many war vessels, merchant steamers and sailing ships, lighters, junks, and other craft were severely crippled or totally lost, and one of the latest estimates places the loss of life at 10,000 Chinese and several Englishmen and other Europeans. The Governor, Sir Matthew Nathan, has decided to appoint a committee to inquire into the failure of the observatory to give due warning of the approach of the typhoon, but he is confident that Dr. Doberck is not to blame in the circumstances. Four days later, on September 22, news was received of the Philippines, south of Manila, having been struck by a typhoon. The information to hand at present is very meagre, owing to the destruction of the telegraph wires, but a gunboat was driven ashore, and the arsenal and the shipping at Cavité suffered considerably.

A PAPER, by Messrs. B. Stracey and F. W. Bennett, on the felsitic agglomerate of Charnwood Forest, is the most important of the contributions relating to natural science contained in vol. x., part ii., of the Transactions of the Leicester Literary and Philosophical Society.

ACCORDING to the report for 1905-6, the Manchester Museum, Owens College, recently received a valuable collection of mammals from N.E. Rhodesia, but funds are lacking for mounting and encasing a representative series of these in the gallery. The museum will shortly also receive a collection of insects made in the same district. The well-known and extensive series of stone implements collected during the last forty years by Mr. R. D. Darbishire has been presented by that gentleman to the



museum. It is satisfactory to learn that the financial condition of the institution has materially improved since the date of the previous report.

PROF. HICKSON's letter on remarkable coelenterates from the west coast of Ireland in *NATURE* of November 2, 1905 (vol. lxxiii., p. 5) is reprinted in a volume just issued on Irish fisheries (Scientific Investigations, 1905, v.). This is followed by a notice of a leach parasitic on torpedoes taken on the Irish coast, and this, again, by the mention of a mollusc of the genus *Lamellaria* captured in a trawl off Cork. The particular species, which is common to both sides of the Atlantic, is new to the Irish fauna. Finally, Mr. S. W. Kemp adds ten species of long-tailed crustaceans to the marine fauna of Ireland.

THE report of the Danish Biological Station for 1903 and 1904, recently issued at Copenhagen as a translation from Fiskeri-Beretning, deals with the distribution and dispersal of the young and eggs of fishes which at one period or another are pelagic. From the study of the Icelandic seas it has been found that three belts may be distinguished in the neighbourhood of land, the first of which is characterised by the presence of pelagic eggs and the minute fry of species with demersal (deep sea) eggs, while the second is inhabited by the young fry of species with pelagic eggs and the older fry of those with demersal ova. In Danish waters the conditions appear to be somewhat more complex, but, speaking generally, it may be stated that the area within the Skaw approximates in its fauna to the first belt, and that outside the Skaw to the second zone.

WE have to acknowledge the receipt of a copy of the first part of the "Bergen's Museum Aarbog" for the current year. In the first paper Mr. J. Rekstad discusses the terraces and raised beaches of western and northern Norway. Among the more noteworthy remains are nodules, from more than one locality, containing beautifully preserved specimens of the skeleton of young coal-fishes (*Gadus virens*). In a second article Mr. C. F. Kolderup records the occurrence in Norway during 1905 of twenty-three earthquakes, all of which were, however, small and local. The capture, in the middle of January, 1904, of no less than forty-seven killer-whales (*Orca gladiator*) at Bildöströmmen is recorded by Mr. J. A. Grieg, who furnishes an illustration of the landing of one of these cetaceans. Several skeletons were preserved, of some of which the author gives measurements and descriptions. In addition to papers by other authors, Prof. R. Collett communicates notes on bottle-nosed whales (*Hyperödon*) and white whales (*Delphinapterus*).

THE sixth number of the *Kew Bulletin* for this year contains the diagnoses of new plants, published under the title "Decades Kewenses, XLII," of which one, described by Dr. Stapf, forms the type of a new genus *Diandrolyra*, order Gramineæ. Mr. J. M. Hillier contributes articles on East Indian dragon's-blood, chiefly the produce of species of *Dæmonorops* and *Ogea* gum obtained from the genera *Daniella* and *Cyanothyrsus*. The account by Mr. W. Watson of a visit to some well-known Irish gardens makes special mention of the magnificent development of the trees, showing how well the climate is suited to forestry. A historical article on the Sydney Botanic Gardens, written by Mr. J. H. Maiden, is reprinted from the *Sydney Morning Herald*.

THE review of Mr. Luther Burbank's work written by Prof. H. de Vries in the *Biologisches Centralblatt*

NO. 1926, VOL. 74]

(September 1) gives the opinions of the foremost scientific plant-breeder on the work of one of the most successful practical plant-breeders. While fully recognising the remarkable acumen of Burbank's judgment and the practical value of his work, Prof. de Vries finds a marked contrast between the aims and methods of the two types of worker. Careful experiment in the cultivation and crossing on a limited scale of pure types with definite characters is the task of the scientific investigator; the hope of the nurseryman lies in the chance possibilities arising out of the production and selection from a vast number of variations; for instance, Mr. Burbank selected his plums from 300,000 hybrids. One of the most important features of Mr. Burbank's work has been the cultivation of remote species with possibilities that have escaped the consideration of less conventional cultivators. The stoneless plum was obtained from crossing some plants, "prunes sans noyau," at one time cultivated in France. An intuitive genius for selection of promising varieties is the key to Mr. Burbank's success.

Two examples of "fluctuating variation" as met with in certain New Zealand plants are noted by Dr. L. Cockayne in vol. xxviii. of the Transactions of the New Zealand Institute. In the first case, two *Celmisias* were found, one growing on the coast, the other in the alpine region, both very similar, except in the proportions of the leaf and general appearance. The question arises whether they should be regarded as distinct species. This, Dr. Cockayne points out, can best be determined by ascertaining whether the two forms reproduce "true." The second paper refers to leaf variation in *Coprosma baueri*. When exposed to sun and wind, the plant bears glossy, recurved, or rolled leaves, whereas in the shade they are thin, flat, and much larger. There is no question of two species in this case, as the two types of leaf may be observed on the same plant, but it suggests a starting point for the evolution of two distinct species.

ALTHOUGH not far distant from the North Island of New Zealand, the flora of the Poor Knights Islands had not been explored until Dr. L. Cockayne was enabled to get ashore for a very brief period last year. Distinguishing three formations of cliff, tall scrub, and meadow, Dr. Cockayne was particularly impressed by the luxuriance of the foliage of the arborescent plants in the scrub, and especially of the dominant plants *Suttonia divaricata* and *Macropiper excelsum*. Apart from the fertility of the soil and the shelter afforded by the dense growth, it was not apparent why such luxuriance should be developed. Another ecological contribution by the same writer, describing the subalpine scrub of the seaward Kaikouras, in the South Island, is published with the former in the Transactions of the New Zealand Institute, vol. xxviii. The peculiarity of this formation, that lies between the forest and the subalpine meadow, consists in the dominance of the composite shrub, *Cassinia albida*, found only in the Kaikoura Mountains, and in the occurrence of a *Ranunculus* growing under the scrub that Dr. Cockayne separates as a distinct species, *Ranunculus lobatus*.

THE third and final part of a series of papers on sands and sediments, by Messrs. T. Mellard Reade and Philip Holland, appears in the volume of the Proceedings of the Liverpool Geological Society for 1905-6. The earlier parts were published in the two preceding volumes. The papers describe a number of experiments made upon modern and ancient sediments to determine the behaviour of the particles when suspended in water and in various solutions;

most of the material was also analysed. The principal conclusions derived from their experiments by the authors are:—(1) that in many sediments of all ages extremely fine particles, especially "quartz-dust," play an important part; (2) that most of the quartz-dust has been produced by the collision and abrasion of quartz grains while suspended in water, and that the perfect rounding of some quartz grains, usually assumed to be due to wind action, may be largely due to this subaqueous abrasion; (3) that carbonate of lime may often be present in suspension in considerable amount in natural waters; and (4) that the microscopic suspended matter is probably an important item in the total solid content of the waters of the open sea. In the same volume Messrs. T. Mellard Reade and Joseph Wright have a short paper on the Pleistocene clays and sands of the Isle of Man, which is mainly occupied by lists of the Foraminifera found in the drift.

ON May 15 the city of Nuremberg opened a national exhibition in commemoration of the centenary of its subjection to the Bavarian Crown. The exhibition, which will remain open until October, has proved eminently successful. It contains a good display of Bavarian manufactures, and is of special interest from the admirable manner in which the mineral resources of the kingdom are shown. The mineral deposits represented include the iron ores of the Fichtelgebirge, coal from the Palatinate, iron pyrites and galena from Bodenmais, salt from Berchtesgaden, copper ore from Imsbach, and graphite from Passau.

THE Engineering Standards Committee has issued its standard specifications for material used in the construction of railway rolling stock. This report, No. 24 (London: Crosby Lockwood and Son, price 10s. 6d. net), covers sixty-two folio pages, and is undoubtedly one of the most complete and valuable of the publications of the committee. It contains specifications for locomotive crank axles and straight axles, carriage and waggon axles, tires, springs, steel forgings, steel blooms, steel castings, copper plates, rods and tubes, brass tubes, and steel for plates, angles, and rivets. In each case specifications are given, with and without chemical analyses. The committee has also issued a standard specification for steel conduits for electrical wiring (report No. 31, price 2s. 6d. net), and a report (No. 28, price 2s. 6d. net) on British standard nuts, bolt-heads, and spanners.

IN the Journal of the Franklin Institute (vol. clxii., No. 2) Mr. Clifford Richardson concludes his elaborate memoir on the petroleum of North America, in which he compares the character of those of the older and newer fields. Those of the earlier days of the industry, from the Appalachian field, were paraffin oils, free from sulphur, specially valuable for the production of illuminants. The petroleum of north-western Ohio and Canada, next developed, being sulphur oils, were far less valuable. The California oil is composed of such a series of hydrocarbons, of a non-paraffin nature, that its value is comparatively small. The oils from the more recently developed fields of Kansas and Texas are of variable character. Those from the Gulf Coastal Plain of Texas and Louisiana are so strongly asphaltic as to be of value only for the production of lubricants, for use as fuel, and as gas-oil.

"THE Effects of Civilisation upon Climate" is the title of an interesting article by Mr. S. L. Bastin in the September number of the *Monthly Review*. As the author points out, the subject is by no means new, and is a matter upon which many authorities find themselves at

variance. As one instance of how a locality may be influenced by some artificial feature the smoke of London is referred to, the effect of which is visible in the hilly villages of Oxfordshire when the wind is in the right quarter. Again, it is well known that in large cities the average annual temperature is higher than in the surrounding country, while the reduction of the amount of marsh land, e.g. in the Fen district, has probably had a decided effect upon the temperature. But these are local instances; whether the climate has changed generally is another matter. Hann and others have shown that there are evidences of changes of small amount sometimes in one direction and sometimes in another, e.g. the fluctuations in the size of European glaciers. The author assumes that British winters are later in coming than they used to be, and quotes that of 1894-5, "when the rigours of the season were scarcely felt until February, and were extended well into March." A discussion of this frost in the Journal of the Royal Meteorological Society shows that the cold period commenced on December 30 and ended on March 5, with a break of a week's mild weather from January 14-21. On January 8 the temperature fell to  $-3^{\circ}$  at Braemar, and was below  $10^{\circ}$  over the central part of north Scotland; after February 20 no readings below  $10^{\circ}$  were recorded. As to the influence of forests, we can have no better authority than Hann; they do reduce the mean air temperature, especially during the warmer part of the year, but whether they increase the amount of rainfall, and, if so, to what extent, cannot yet be definitely answered. We hope with Mr. Bastin that special attention will be given to this important subject in the future, and that, with better data at command, valuable conclusions may be obtained.

IN the *American Journal of Science* (vol. xxii., p. 176) Mr. S. E. Moody gives an account of experiments on the hydrolysis of iron, chromium, tin, cobalt, and nickel salts by solutions containing alkali iodide and iodate. In this reaction an equivalent quantity of iodine is set free, the estimation of which may be used for the quantitative determination of any of the above metals. In the case of zinc salts, the hydrolytic decomposition is only partial, and a basic salt is precipitated instead of the hydroxide.

IN the *Annalen der Physik* (vol. xx., p. 677) Dr. E. Marx gives an account of an experimental investigation relative to the velocity of Röntgen rays. It is estimated that the method and apparatus employed permit the velocity to be determined with an accuracy represented by a probable error of 1 per cent. Within this limit the velocity of propagation of Röntgen radiation is equal to that of light. This result furnishes strong evidence in favour of the view that Röntgen radiation consists in electromagnetic pulse transmission through the ether.

THE velocity of the  $\alpha$  particle emitted by radium C at various points of its path has been recently measured by Prof. Rutherford (*Phil. Mag.*, xii., 134). After traversing 7.0 centimetres of air the  $\alpha$  particle is no longer capable of exerting any sensible photographic action, although its velocity is still approximately four-tenths of the velocity with which it is emitted from the active source. The much more rapid decrease of the photographic effect of the particle towards the end of its path as compared with the alteration in its kinetic energy necessitates the assumption of a certain critical velocity below which the particle is unable to produce the characteristic effects, or of a very rapid decrease in the velocity when this reaches a certain value.

In the *Zeitschrift für Elektrochemie* (vol. xii., p. 513) Prof. W. Kistiakowsky points out the existence of a relationship between the surface-tension values of different liquids which is analogous to the well-known Trouton's rule. If  $k$  denote the capillary constant of a liquid at its boiling point,  $m$  the molecular weight, and  $T$  the boiling point on the absolute scale, then  $mk/T$  is constant and equal to 0.0116 for about forty non-associated liquids which have been examined. In the case of associated liquids, such as the alcohols and fatty acids, the value of  $mk/T$  is much smaller, and on account of the considerable change in the value of the factor it appears to be eminently suited for ascertaining the existence of association in the liquid state of aggregation.

THE report of the principal chemist of the Government Laboratory for the year ending March 31 furnishes some interesting reading. The total number of samples examined at the laboratory at Clement's Inn Passage during the year was 106,779, the greater part being in connection with the revenue departments. In the Customs the increase in the number of samples examined, as compared with last year, was 2389, the Excise showing an increase of more than 18,000. Special attention was given to establishing a systematic check on the "obscuration" of enumerated spirits, that is, the change in the apparent strength of spirits, as determined by the hydrometer, caused by the presence of solid matters in solution. It is noteworthy that, in the case of tea, the evidence of deliberate adulteration was extremely rare. A small proportion of the tea entering the country was declared to be unsound and unfit for human consumption. Such condemned tea does not pay duty, and, after being denatured by the addition of lime and asafœtida, is allowed to be used in the manufacture of caffeine. Little improvement is shown in the freedom from adulteration of the beer supplied by publicans; 11.1 per cent. of the samples taken were found to be diluted. There is good reason, moreover, to believe that a notable amount of butter adulteration takes place in this country. A considerable increase is shown in the quantity of duty-free spirit used in colleges for purposes of research.

SINCE the atomic weight of silver is the basis upon which most of the atomic weights of other elements are founded, even a small change in the accepted value is not without importance. The *Comptes rendus* for September 10 contains a note on this subject by P. A. Guye and G. Ter-Gazarian. Owing to the great improvements in recent years in the methods of dealing with gases, physicochemical methods of determining atomic weights, originally only used as a rough guide for the purely chemical methods, have reached an accuracy at least equalling the latter. If the atomic weights of carbon, hydrogen, nitrogen, and chlorine related directly to oxygen by physicochemical methods be taken as a basis, the value 107.89 is obtained for silver instead of 107.93, obtained by Stas by the use of chlorates, bromates, and iodates. The authors give a summary of the work done by various workers on the latter compounds, and note a possible cause of error in the presence of potassium chloride in the potassium chlorate used. They show that these two compounds, on account of the fact that the chloride forms a solid solution of nearly constant composition, are very difficult to separate. They find that potassium chlorate, purified as far as possible by re-crystallisation, contains 2.7 parts of chloride per 10,000. Applying this correction to Stas's figures, an atomic weight of 107.89 is obtained, nearly identical with

the figures of Marignac in the analysis of silver chlorate; of Dixon and Edgar, by the direct determination of the ratio H:Cl; and of Richards and Wells, the ratio Ag:AgCl. In this way the results of the chemical and physicochemical methods are brought into agreement, leading to the conclusion that the atomic weight of silver should be lowered from 107.93 to 107.89.

### OUR ASTRONOMICAL COLUMN.

#### ASTRONOMICAL OCCURRENCES IN OCTOBER:—

- Oct. 2. Pallas (mag. 8.0) in opposition to the Sun.
- 3. 9h. 19m. Minimum of Algol ( $\beta$  Persei).
- 4. 15h. 35m. to 16h. 52m. Moon occults  $\mu$  Ceti (mag. 4.4).
- 6. 12h. 30m. to 15h. 28m. Transit of Jupiter's Sat. III. (Ganymede).
- 9. 16h. 0m. Jupiter in conjunction with Moon (Jupiter  $2^{\circ} 12' N$ ).
- 15. Venus. Illuminated portion of disc = 0.333; of Mars = 0.976.
- 18–22. Epoch of October meteoric shower (Radiant  $92^{\circ} + 15^{\circ}$ ).
- 23. 11h. 1m. Minimum of Algol ( $\beta$  Persei).
- 25. 6h. 49m. to 6h. 56m. Moon occults  $\iota$  Capricorni (mag. 4.3).
- „ 19h. 0m. Venus at greatest brilliancy.
- 26. 7h. 50m. Minimum of Algol ( $\beta$  Persei).
- „ Saturn. Major axis of outer ring =  $42''.62$ ; minor axis =  $4''.73$ .
- 29. 13h. 0m. Jupiter stationary.

THE TOTAL SOLAR ECLIPSE OF JANUARY, 1907.—In a letter to the *Observatory* (No. 374), Mr. W. T. Lynn discusses the accessibility and suitability of Andishan as a place wherefrom to observe the total eclipse of the sun which will take place in January next year. This town is situated to the north-east of Samarkand, in the Khanate of Khokand, its approximate position being long. =  $72^{\circ} 17' E.$ , lat. =  $40^{\circ} 50' N$ . It is on the Russian Central Asiatic Railway, about 170 miles south-east of Tashkent. As a new line of railway runs to the latter place from Orenburg, the journey from Europe should prove a comparatively straightforward one. Andishan lies in the fertile valley of Ferghana, at the junction of the river Kara Darya (a tributary of the Syr Darya) and a smaller stream, so that there should be little difficulty in finding a suitable observing site for the eclipse parties. The eclipse will take place on January 14, 1907 (civil time), and the shadow track will be very narrow, thus limiting the choice of stations; the duration of totality will be about two minutes. By an obvious slip, the date is given as January 4 and the duration of totality as two seconds in Mr. Lynn's letter, as published in the *Observatory*.

OBSERVATIONS OF PHOEBE IN MAY AND JUNE, 1906.—Circular 118 of the Harvard College Observatory gives the positions of Phœbe, the ninth satellite of Saturn, as determined from six photographs obtained between May 18 and June 28, with the 24-inch Bruce telescope, at Arequipa. The places thus obtained are compared with those given by the ephemeris published in the *Nautical Almanac* for 1906, the differences (O–C) in R.A. and declination being given.

THE COLOURS OF SUN-SPOTS.—In the September number of the *Bulletin de la Société astronomique de France* M. Th. Hansen, of Praestö, Denmark, states that from many years' observations of sun-spots he is convinced that sun-spots exhibit colours proper to themselves, and not merely the results of instrumental chromatism. He observes that the spot nuclei are rarely, if ever, a dead black, but generally are of a decided violet colour. The preceding part of the spot is most often of a yellow colour, whilst red is generally predominant in the "following" parts, although green is also seen there. On August 11, 1903, a small but dazzling white facula appeared in the centre of a black spot whilst M. Hansen was drawing the same. Two plates showing the colours observed in the large spot of November, 1903, accompany the communi-